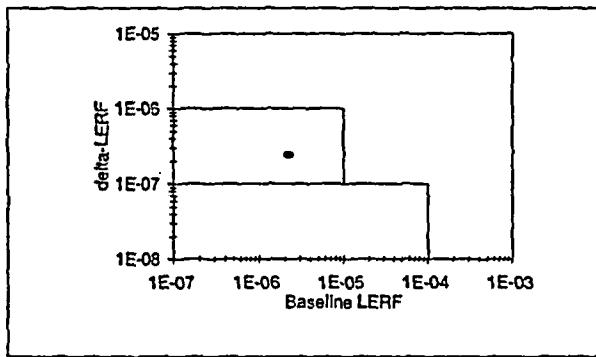
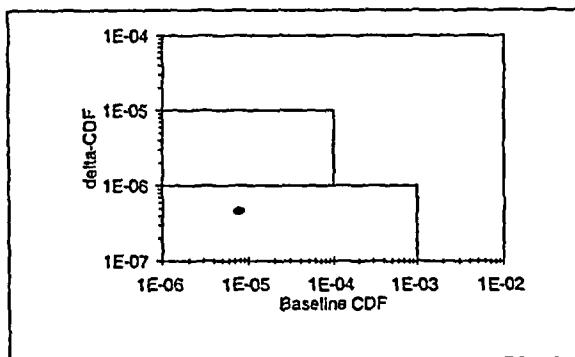


CDF	Region 3	Region 2	Results	LERF	Region 3	Region 2	Results
1E-03	1E-07	1E-07	1E-08	1E-04	1E-08	1E-08	1E-09
1E-03	1E-06	1E-06	1E-08	1E-04	1E-07	1E-07	1E-09
1E-04	1E-06	1E-06	1E-08	1E-05	1E-07	1E-07	1E-09
1E-04	1E-06	1E-05	1E-08	1E-05	1E-07	1E-06	1E-09
7.77E-06	1E-06	1E-05	4.60E-07	2.23E-06	1E-07	1E-06	2.40E-07
1E-06	1E-06	1E-05	1E-08	1E-07	1E-07	1E-06	1E-09



	CDF	LERF
pre-EPU	7.77E-06	2.23E-06
delta (per licensee)	3.30E-07	1.10E-07
delta (overpressure credit)	1.30E-07	1.30E-07
total delta	4.6E-07	2.4E-07
post-EPU	8.23E-06	2.47E-06

B/1



TEXT ONLY VERSION

It's easy as



Walking Instructions

5.92

2.4

2368

1184

13,208

Walk a short distance S on CONNECTICUT AVE NW.

Walk straight on 17TH ST NW.

Walk 1 approx. block S on 17TH ST NW.

Turn right on I ST NW.

Walk 1 approx. block W on I ST NW.

Total walking is 0.18 miles.



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More options?



Start Over

BACK

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This site is designed by Washington Metropolitan Area Transit Authority

Non-Conservative

① PTA mission time of ≥ 4 h; credit > 2 days

② PTA. FIT only $\geq 2''$ GFA; smaller holes could also depreciate

Conservative

① LLocA in PTA is $\geq 6''$; problem for DCDD (work frequency too high)

② Doesn't consider partial structure flipping

③ LLocA per +/- still provides nice floor with conserving

④ No credit for A+C closure due initial secondary condition
second level ...

LLOCA Diagram

EPRI application

$2.40 \times 10^{-5}/y$

IPE (WASH-1400)

$1.0 \times 10^{-4}/y$

LLOCA

$\Rightarrow 26''$ DIA

SPAR.

$3.0 \times 10^{-5}/y$

Primary

Containment

Containment Isolation (PCI)

Section 3.2.31

- No venting or depressurization during accident
- If there is no venting, then have inadmissible flow rate with all piping tanks

Failure = hole $> 2''$ DIA

Slow venting (loss of CTR) \Rightarrow "TW" requirement

All CI values fail closed on loss of IP except

from vacuum relief (SS-11A, -11B) {only credit
(from secondary containment - RCS) {tw < V}

So, using the IPE $ACDF = 8 LERF = 6 \times 10^{-7}/y \xrightarrow{\text{IPE too large}} 1.3 \times 10^{-7}/y \xrightarrow{\text{CTR too large}}$

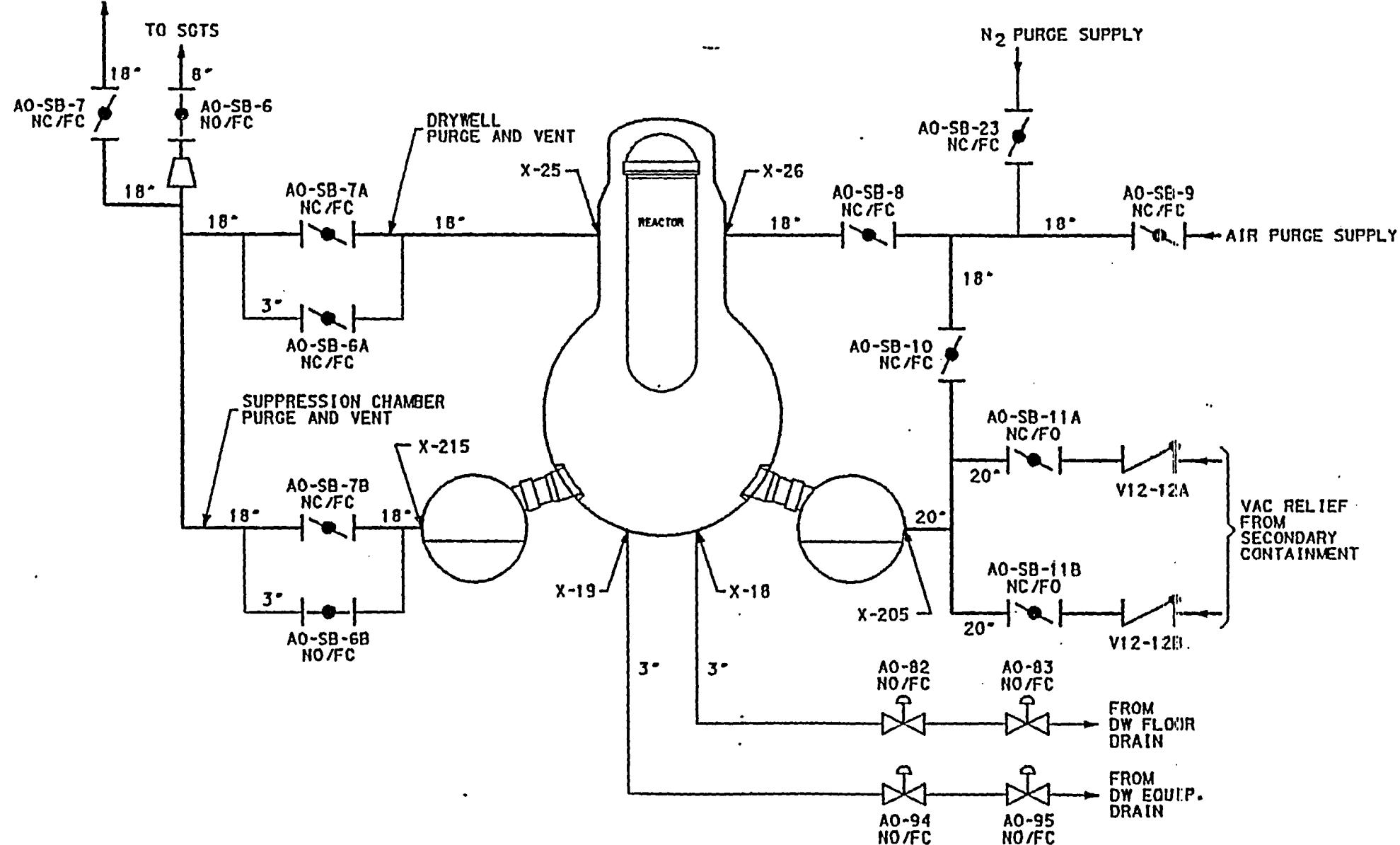
LPC-I success criteria in 1 pump and 1 injection line

\Rightarrow If cavitation only reduces the flow (but
doesn't destroy the pump), could change
the success criteria if there's no overpressure

\Rightarrow small dipper due to CTR

* Operation errors - failure to turn off drywell pumps
- Garelli has done work to look on this issue

TO REACTOR BLDG.
EXHAUST FAN
RTF-5
RX BLDG



VERMONT YANKEE
PRIMARY CONTAINMENT ISOLATION DIAGRAM
FIGURE 3.2.31A

$\overline{IS^*}$

\Rightarrow

IS60*
IS1*
IS26
IS2*

* indicates
gates to be
developed

\Rightarrow

IS60*
IS8*
IS9*
IS4*
IS26
IS2*

✓ don't want developed

(4) IS60*

IS16*

IS18*

IS4*

IS26*

IS2*

(5)

IS60*

IS16*

IS17*

IS18*

IS19*

IS4*

IS26*

IS38*

IS17*

IS46*

IS19*

IS14*

IS15*

(6)

IS60 5.03E-3

IS16 1.22E-4

IS18 6.07E-5

IS4 6.63E-4

IS26 3.10E-5

IS38 1.58E-3

IS46 6.09E-5

IS14 1.20E-4

IS60 1.20E-4

IS17

1.58E-3

IS19

1.22E-4

IS12

1.58E-3

IS19

1.22E-4

✓ 5.03E-3 primary tie back

✓ 1.93E-7 WW purge out vent

✓ 7.43E-9 continuous exhaust

✓ 6.63E-4 WW equipment air

✓ 3.10E-5 floor drains

✓ 5.97E-3 sign out manual

✓ 2.50E-6 WW purge out vent

✓ 7.43E-9 WW purge supply

✓ 1.20E-4 vacuum break to RE

✓ 1.20E-4 vacuum break to PL

✓ 5.97E-3

* No credit for 100V closure
(IA + 120 VAC vital power)

5.97E-3

CCF ANALYSIS

$$Q_T = 1.52E-3 \quad \text{Assume non-staggered testing}$$

Table 5-11, NUREG/CR-0485

$$L_1 = 0.95000 \quad *1 \quad 0.95000$$

$$N_2 = 0.04260 \quad *1 \quad 0.04260$$

$$N_3 = 0.03030 \quad *1 \quad 0.03030$$

$$N_4 = 0.010440 \quad *1 \quad 0.010440$$

$$\alpha_0 = 1.09730$$

$$Q_1^{(4)} = \frac{1}{(3)} - \frac{0.95000}{1.09730} - 1.52E-3 = 1.32E-3$$

$$Q_2^{(4)} = \frac{2}{(3)} - \frac{0.04260}{1.09730} - 1.52E-3 = 3.93E-5$$

$$Q_3^{(4)} = \frac{1}{(3)} - \frac{0.03030}{1.09730} - 1.52E-3 = 4.20E-5$$

$$Q_4^{(4)} = \frac{1}{(3)} - \frac{0.010440}{1.09730} - 1.52E-3 = 4.12E-4$$

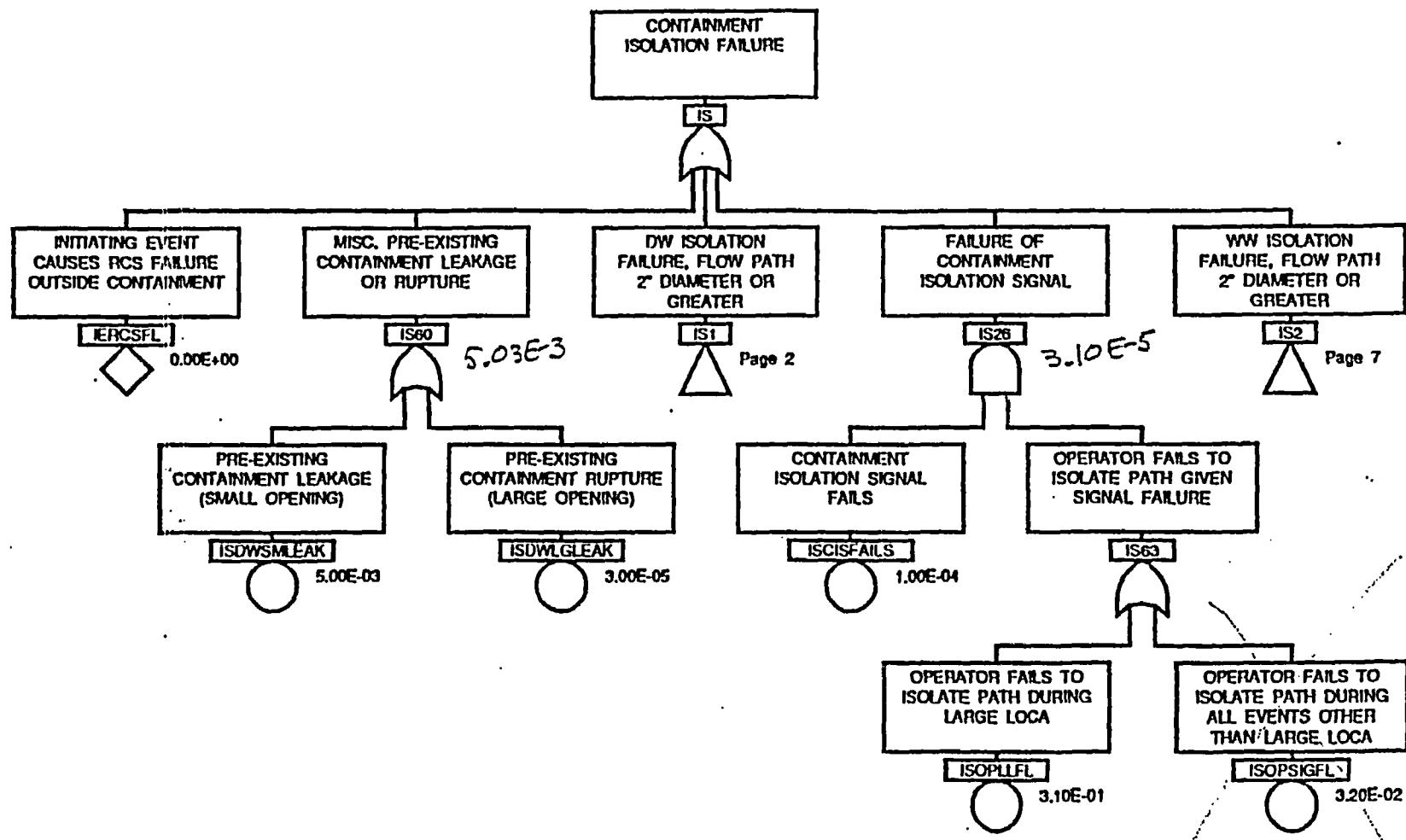
From Table 5-2 (Case 16):

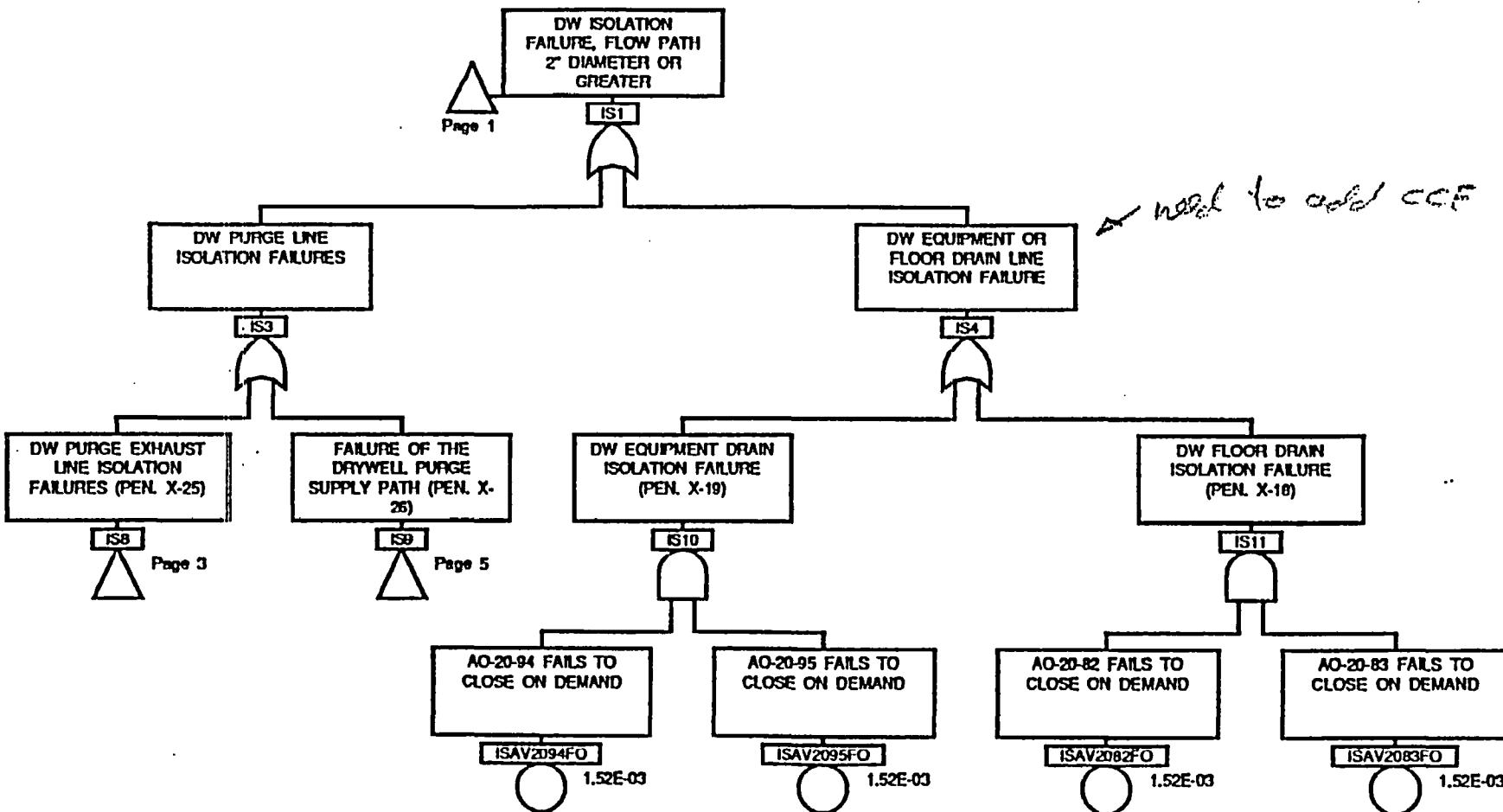
$$Q_S = 2Q_1^2 + 2Q_2 + 6Q_1Q_2 + 2Q_2^2 + 4Q_3 + Q_4$$

$$= 2(1.32E-3)^2 + 2(3.93E-5) + 6(1.32E-3)(3.93E-5)$$

$$+ 2(3.93E-5)^2 + 4(4.20E-5) + 4.12E-4$$

$$= 6.63E-4$$





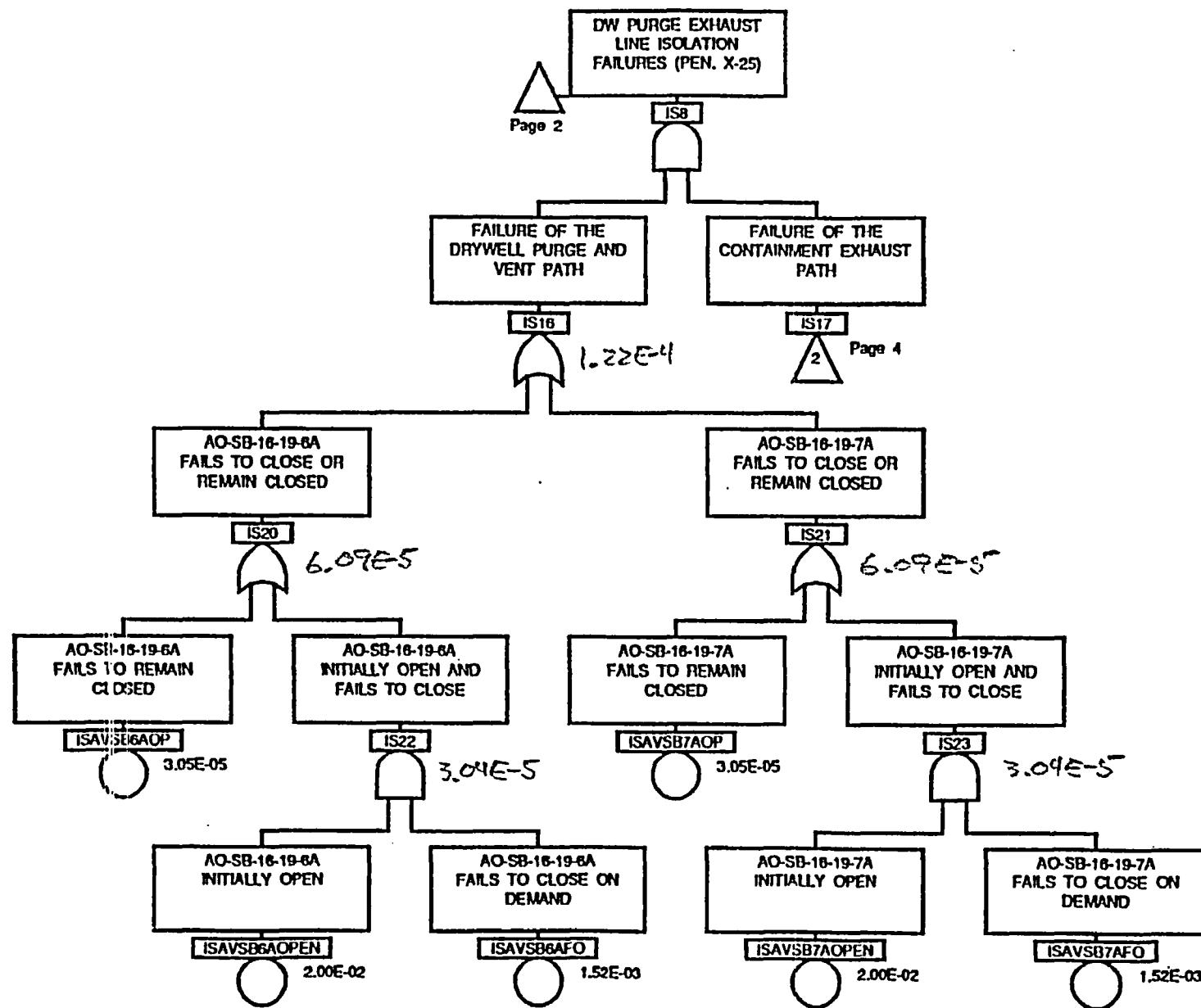
1

2

3

4

5



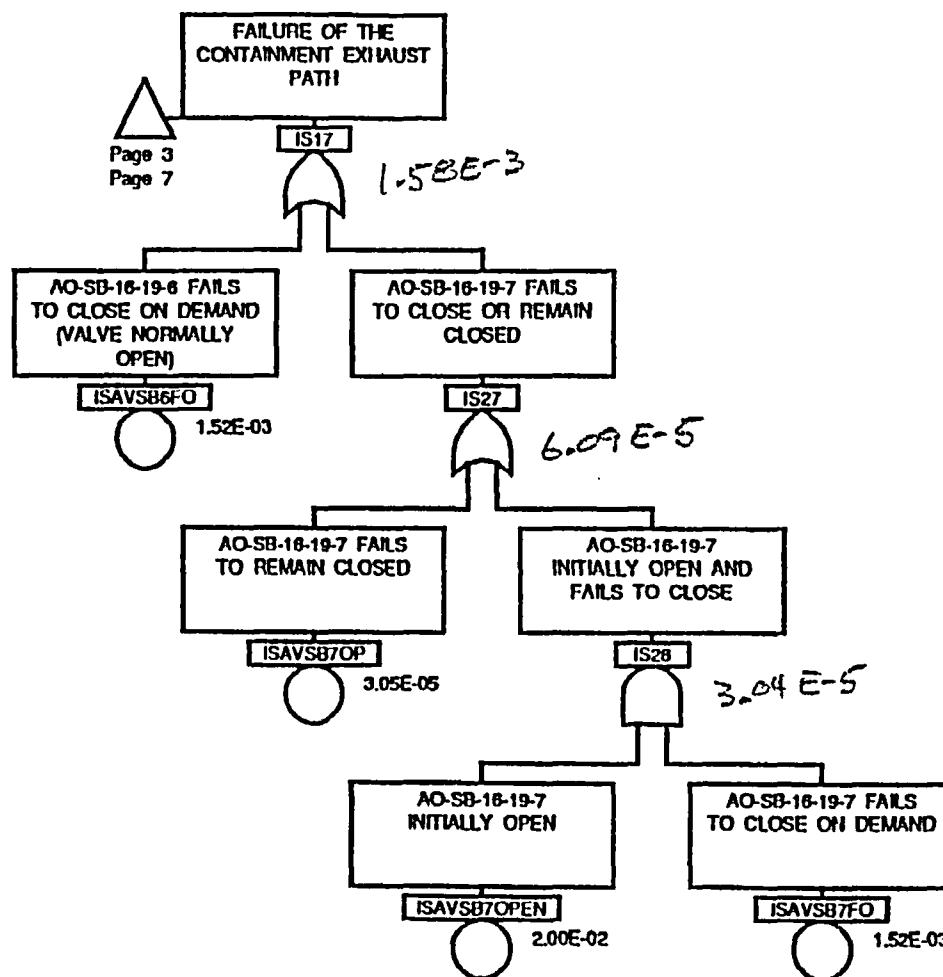
1 1 2 1 3 1 4 1

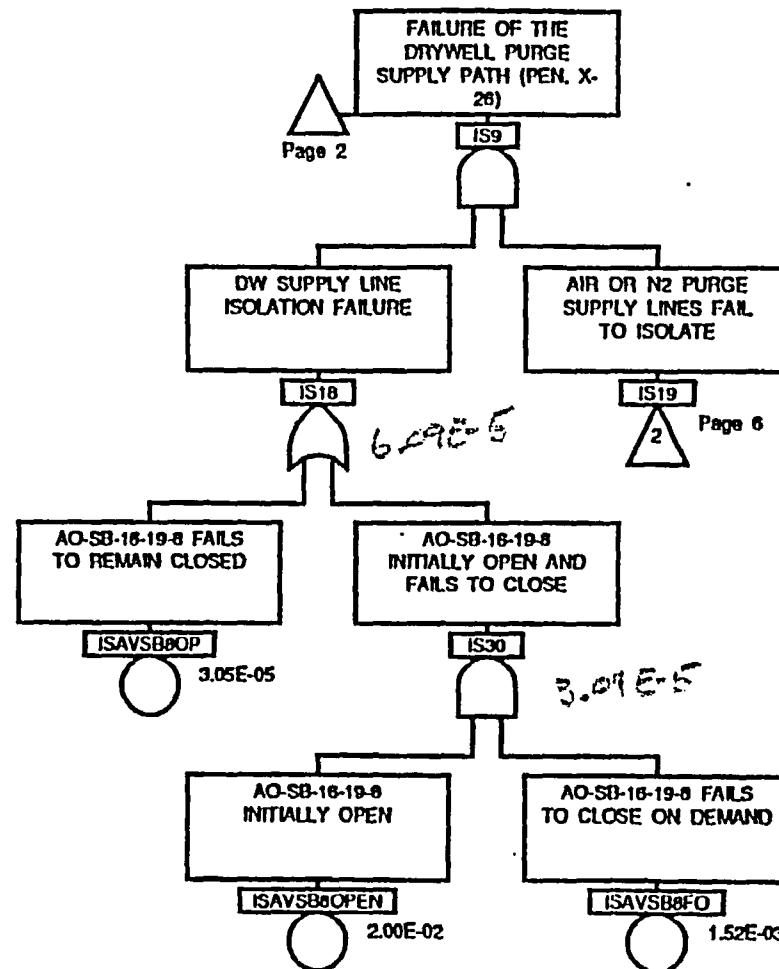
PRIMARY CONTAINMENT ISOLATION

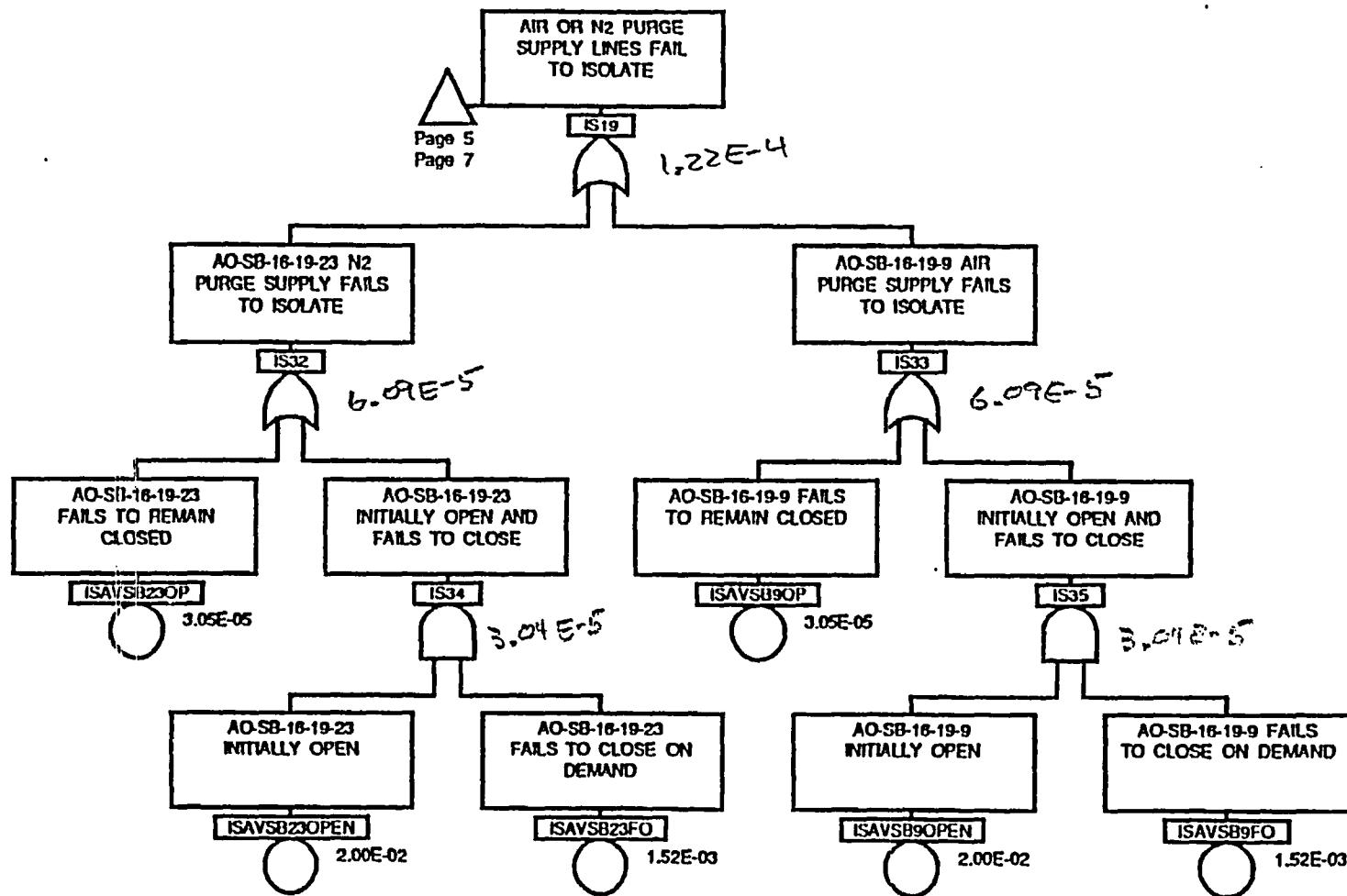
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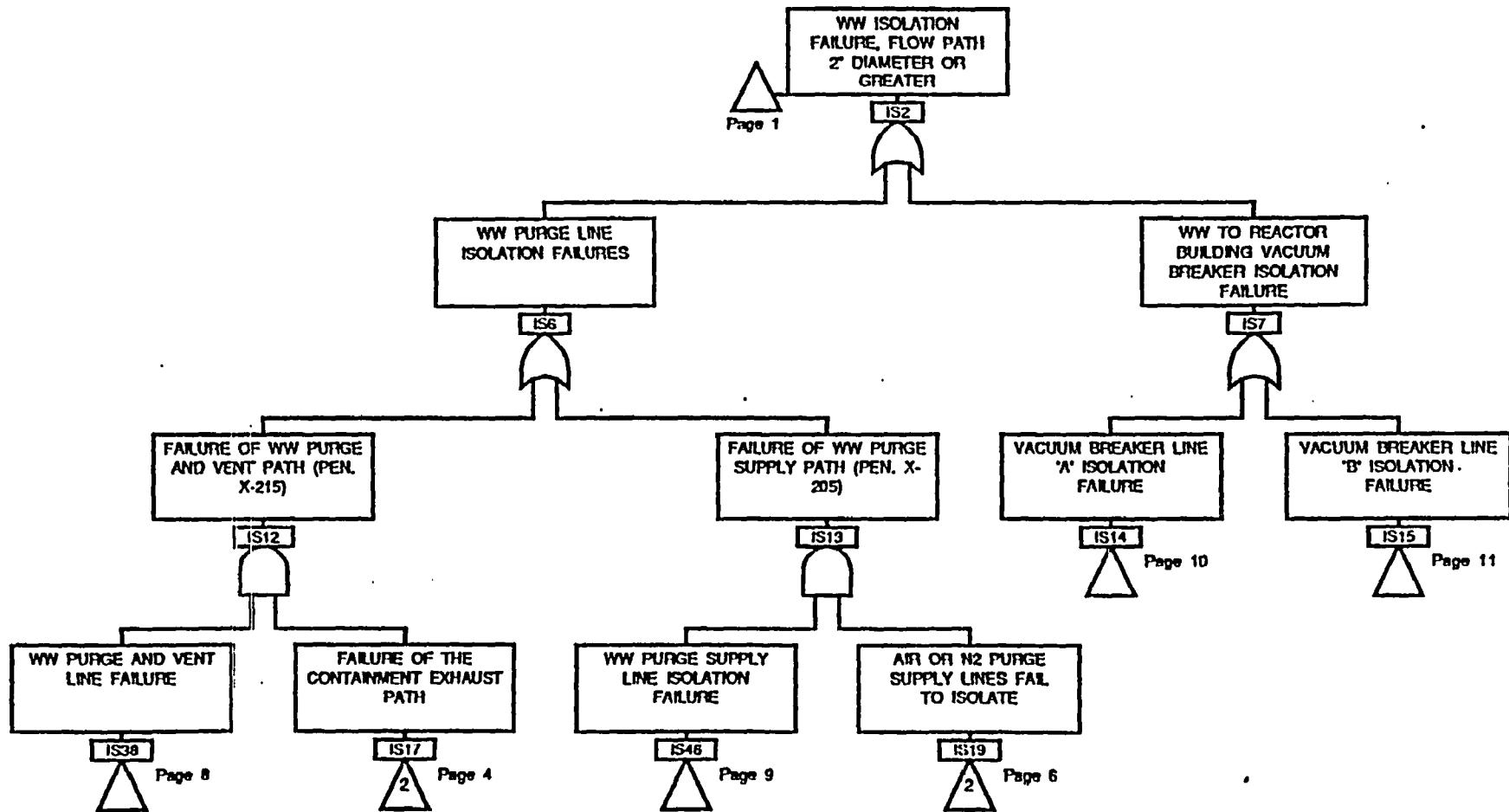
Page 3

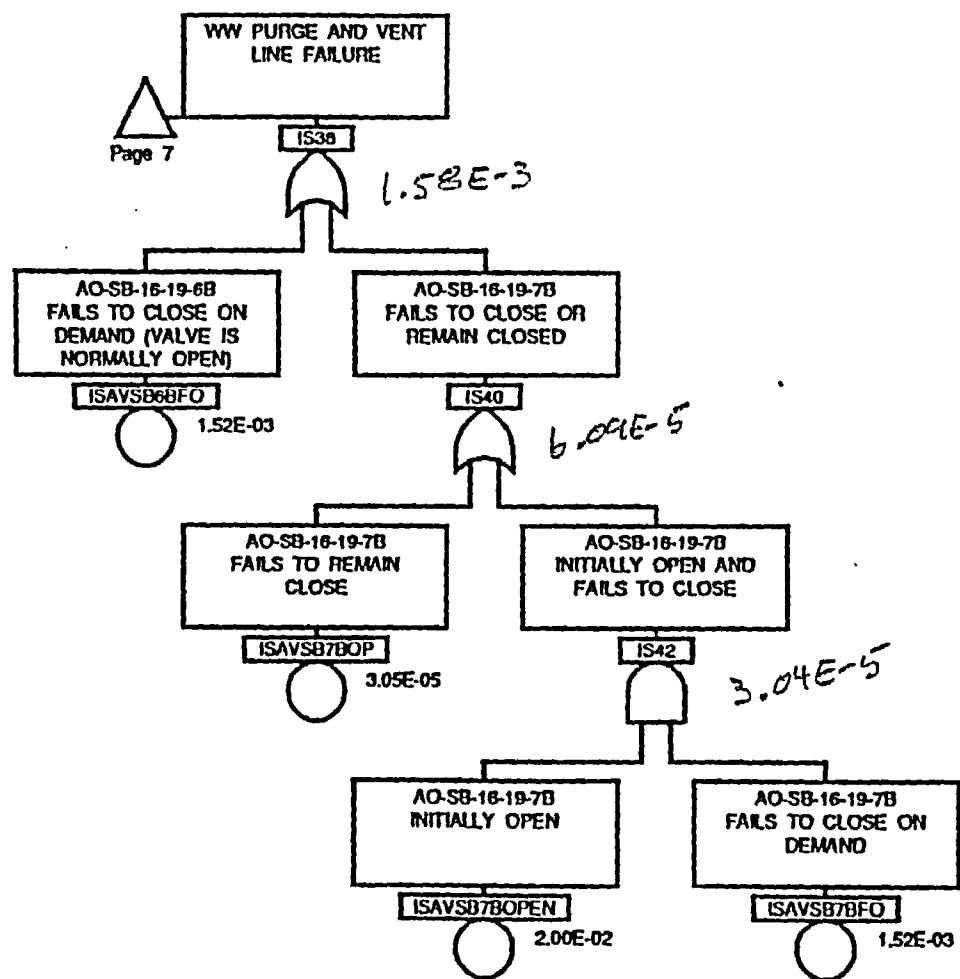


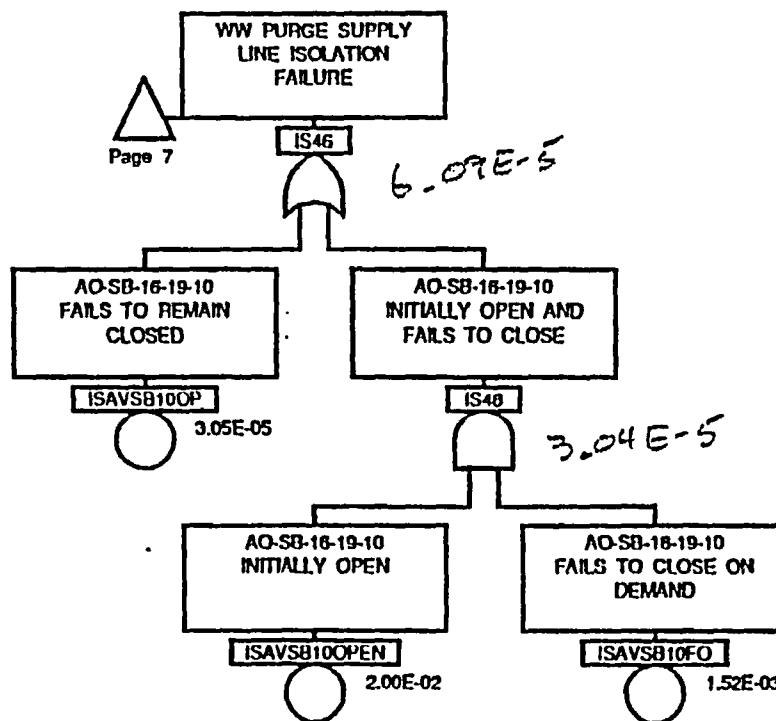


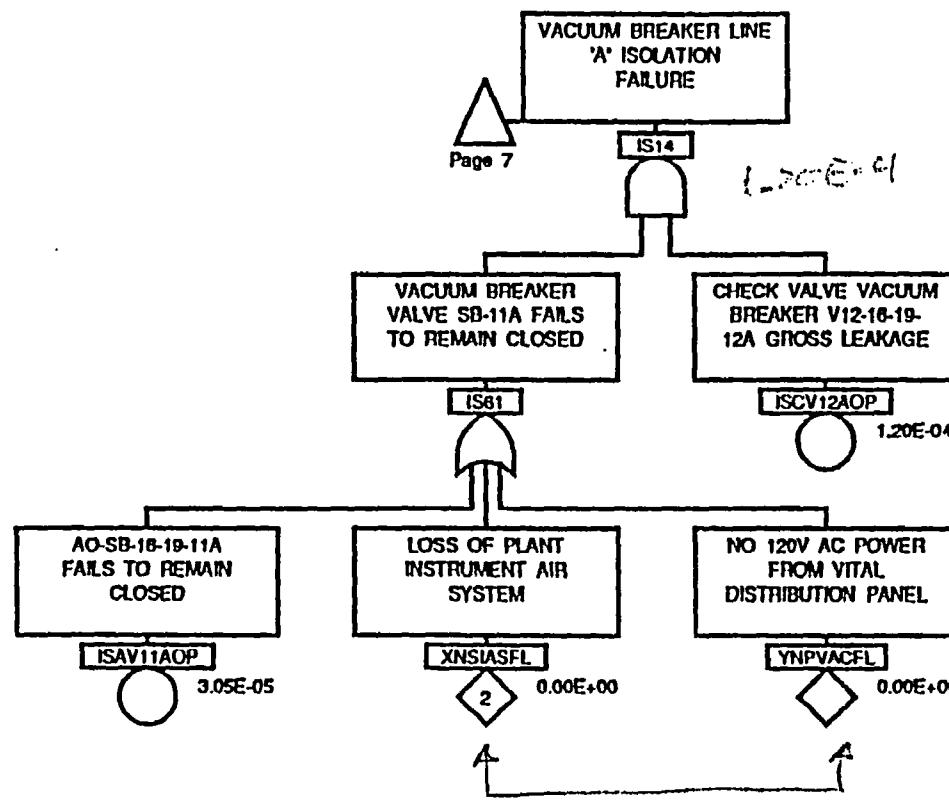


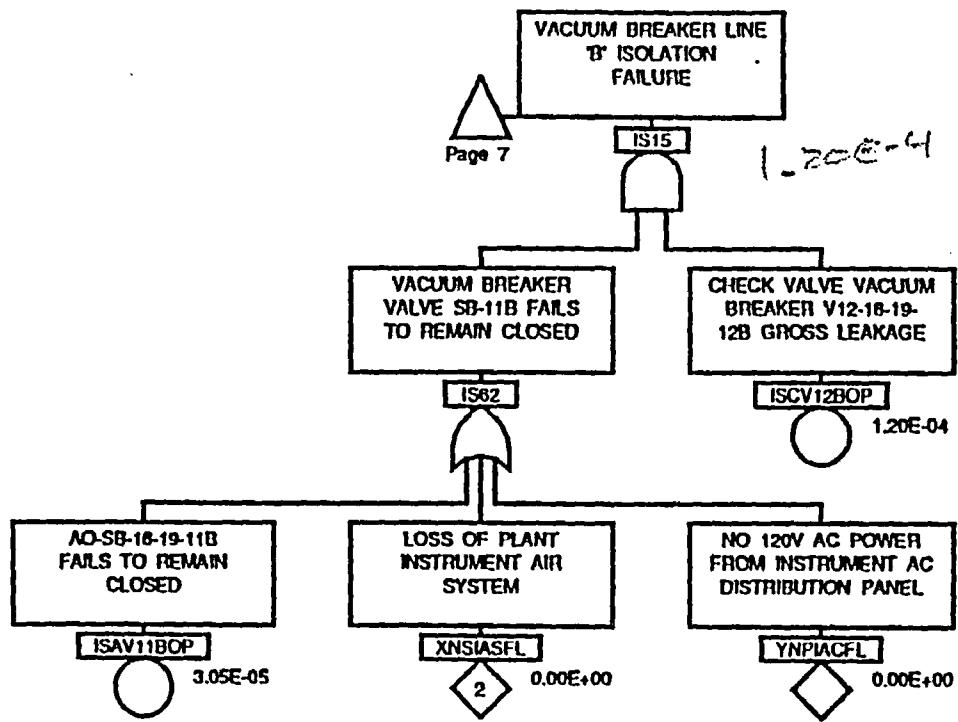
1 1 2 1 3 1 4 1











SEE p-1D

pressurizer, steam generator, RPV) are the most susceptible due to postulated common cause bolting failures, larger transients, and the existence of multiple fabrication defects.

E.3. Plant Aging Effects on LOCA Frequencies: Quantitative Results

E.3.a. LOCA Frequencies

Nine panel members provided quantitative PWR information and eight panel members provided quantitative BWR information. The total BWR and PWR passive system LOCA frequencies are provided in Table 3. These frequencies are cumulative for each successive category. For example LOCA category 1 includes frequency LOCA categories 2 - 6 as well. These frequencies can also be presented in selected flow rate or break size ranges to agree with LOCA definitions used within PRAs. See Table 1 in the main paper.

Table 3: Total Preliminary BWR and PWR Frequencies

Plant Type	LOCA Size (GPM)	Eff. Break Size (in)	Current Day Estimates (per cal. yr)				Next 15 Year Estimates (per cal. yr)			
			(25 yr fleet average operation)				(End of original license)			
			5%	Median	Mean	95%	5%	Median	Mean	95%
BWR	> 100	1/2	3.0E-05	2.2E-04	4.7E-04	1.7E-03	2.3E-05	2.0E-04	5.1E-04	1.9E-03
	> 1,500	1 7/8	2.2E-06	4.3E-05	1.3E-04	5.0E-04	1.8E-06	3.8E-05	1.2E-04	4.7E-04
	> 5,000	3 1/4	2.7E-07	5.7E-06	2.4E-05	9.4E-05	2.4E-07	4.7E-06	2.1E-05	8.0E-05
	> 25,000	7	6.6E-08	1.4E-06	6.0E-06	2.3E-05	5.7E-08	1.2E-06	6.6E-06	2.5E-05
	> 100,000	18	1.5E-08	1.1E-07	2.2E-06	6.3E-06	1.0E-08	1.2E-07	2.4E-06	6.9E-06
	> 500,000	41	3.5E-11	8.5E-10	2.3E-09	8.6E-09	2.8E-11	9.7E-10	2.5E-09	9.5E-09
PWR	> 100	1/2	7.3E-04	3.7E-03	6.2E-03	2.0E-02	3.0E-04	1.1E-03	2.1E-03	7.5E-03
	> 1,500	1 5/8	6.9E-06	9.9E-05	2.3E-04	8.5E-04	4.9E-06	1.0E-04	2.5E-04	9.3E-04
	> 5,000	3	1.6E-07	4.9E-06	1.6E-05	6.2E-05	3.1E-07	6.6E-06	1.8E-05	7.0E-05
	> 25,000	7	1.1E-08	6.3E-07	2.3E-06	8.8E-06	6.0E-08	6.3E-07	2.5E-06	9.6E-06
	> 100,000	14	5.7E-10	7.5E-09	3.9E-08	1.5E-07	9.3E-10	1.2E-08	6.1E-08	2.4E-07
	> 500,000	31	4.2E-11	1.4E-09	2.3E-08	7.0E-08	1.0E-10	2.8E-09	4.6E-08	1.7E-07

Notes: 1. Final frequencies are subject to changes resulting from peer review, stakeholder feedback, and ongoing sensitivity analysis.

2. Sensitivity analysis is ongoing to examine the robustness of estimates.

The 5%, median, and 95% values are the medians of the panel members' total BWR and PWR estimates calculated from their responses. The mean values are calculated based on the assumption of a lognormal distribution with the corresponding median and 95th percentile values listed in Table 3. The LOCA size for each category is also provided along with the correlation between this flow rate and the minimum effective break size. It is again worth stressing that while each LOCA category is defined in terms of its flow rate, most panel members considered effective break size in

140

CURRENT POSITION ON ALLOWING CREDIT FOR CONTAINMENT ACCIDENT PRESSURE IN DETERMINING AVAILABLE NPSH

Current Position:

1. Positions 1.3.1.1 and 2.1.1.1 of Regulatory Guide 1.82 Rev 3 implies that no credit for containment accident pressure should be taken when determining available NPSH for other than currently operating reactors (none for new designs). *already stay intact credit is voluntary*
2. Positions 1.3.1.2 and 2.1.1.2 state that for operating PWRs and BWRs, credit for accident pressure is allowed when "the design [of the ECCS and containment heat removal pump systems] cannot be practicably altered." The discussion section of RG 1.82 Rev 3 states that "for some operating reactors, credit for containment accident pressure may be necessary."

These statements and positions have been implemented to mean that credit is allowed when: (1) a conservative calculation shows that sufficient containment accident pressure exists, (2) the temperature of the pumped water is conservatively high, (3) the required NPSH is conservatively high, and (4) no more credit (with some margin) is approved than that which is needed.

3. Containment integrity is assumed consistent with the design basis accident assumptions.
4. Operator actions are accomplished consistent with the EOPs (such as initiating containment cooling, controlling pump flow and control of containment sprays).
5. No test of "necessity" or specific cause of the NPSH deficiency is part of the criteria for allowing credit for containment overpressure.

Proposed Modified Position

1. Item 1 above remains unchanged.
2. Item 2 above remains unchanged except that (4) is deleted. The NRC will not limit the amount of overpressure up to the amount determined to be available by a conservative calculation.
3. The licensee will be required to perform a risk analysis. This analysis must show that credit for containment overpressure results in plant risk remaining acceptable. Containment integrity and the availability of sufficient overpressure will be demonstrated as part of the risk analyses. Operator errors in carrying out the EOPs will be included in the PRA.
4. No test of "necessity" or specific cause of the NPSH deficiency is part of the criteria for allowing credit for containment overpressure.

PLAN FOR RE-EVALUATING CREDIT FOR CONTAINMENT ACCIDENT PRESSURE

1. Withdraw RG 1.1
2. Modify RG 1.82 Rev 3 to reflect the modified position
3. Modify SRP 6.2.2 to reflect modified position